

The 'Birth of Doubt' and 'The Existence of Other Possibilities': Exploring How the ACAD Toolkit Supports Design for Learning

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ABSTRACT

The circumstances in which humans live and learn are subject to constant change. Given these cycles of change, educational designers (teachers, instructional designers, and others) often search for new models and frameworks to support their work, to ensure their designs are in alignment with valued forms of learning activity. Our research foregrounds the entanglement of people (the relational), tasks (the conceptual) and tools (the digital and material) in formal and informal learning settings. In this paper, we explore the use of the ACAD toolkit *with the aim of understanding how this analytical tool supports design for learning*. A thematic analysis of five workshops attended by 40 educators from diverse professional and academic backgrounds in Spain and Argentina, reveals how ACAD supports educational designers in four distinctive ways: encouraging dynamic engagement with key elements and concepts; supporting the visualization of (dis)connections and (in)coherence in designs; prompting critical reflection on past practices and contexts; and stimulating discussion about future teaching practices. A key contribution of this article is the discussion about how the ACAD toolkit helps educators see the ways in which all learning is situated, subject to constraints and affordances at multiple scale levels, and oriented towards certain pedagogical purposes or values.



Received 2023-06-09

Revised 2023-06-14

Accepted 2023-06-19

Published 2023-07-15

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DOI <https://doi.org/10.7821/naer.2023.7.1494>

Pages: 340-359

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Keywords LEARNING DESIGN, DESIGN FOR LEARNING, EDUCATIONAL DESIGN, ACADEMIC PROFESSIONAL DEVELOPMENT

1 INTRODUCTION

Recent debates in education have been dominated by a sense of urgency related to the need to prepare students to address complex issues (e.g., climate, conflict, human displacement). Such complex scenarios require understanding how the global and local intersect and how this knowledge can be translated into teaching and learning practice (Castañeda

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& Selwyn, 2018). Not only students but educators as well need to become conversant with systems thinking, in order to develop their ability to see the whole, the parts, and the relations between them at multiple scale levels from the local, to the regional, to the global (Markauskaite, Carvalho, & Fawns, 2023; Misiaszek, 2021). In addition, educators need to be able to articulate and share the underlying values guiding their learning design decisions. And they need to commit to collaboratively transform structures and processes in ways that honour these values. This paper contributes to this endeavour, exploring one way of supporting educational designers (teachers, instructional designers, and others) in tracing connections between learning theories, educational design, and teaching and learning practice (Carvalho & Yeoman, 2018; Castañeda & Williamson, 2021). This design work supports educators and students to learn the skills and knowledge required to address global challenges in the communities in which they live and act.

Since the COVID19 pandemic new challenges emerged, amplifying the calls for educational designs capable of supporting an ever-shifting mix of online and in-person learning activity. Educators need to develop integrated designs, and attend to design choices that are framed in terms of pedagogical purpose rather than novelty or preconfigured solutions. Having understood the complexity of context and made purposeful pedagogical choices, educational designers must then develop pedagogical strategies to encourage collaboration, individual agency, productive participation, and authentic co-creation in learning (Castañeda et al., 2023).

Despite increasingly complex designs, teacher training and academic professional development tend to focus on discrete aspects of teaching practice (e.g., content selection, technology-use, resource development, and pedagogical strategies), leaving educators to integrate them into their practice with very little support (Castañeda, Esteve-Mon, Adell, & Prestridge, 2022; Papanikolaou, Makri, & Roussos, 2017). As such, frameworks and learning designs capable of supporting integration are becoming increasingly important (Wasson & Kirschner, 2020) to provide the means to analyse and map heterogeneous assemblages of people, tasks and tools, and enable the creation of designs that honour pedagogical values. Importantly, when teachers explore varied learning designs, they are more likely to develop extended technical and practical rationales about the pedagogical foundations of their practice, and this improves their own practices (Mor & Mogilevsky, 2013).

The present study draws on a body of work exploring productive ways of supporting design for learning (Carvalho, Goodyear, & de Laat, 2017; Goodyear & Carvalho, 2014; Goodyear, Carvalho, & Yeoman, 2021; Goodyear, Carvalho, Yeoman, Castañeda, & Adell, 2021; Yeoman & Carvalho, 2019). Our aim is to develop theoretically informed methods to support design for learning across a range of settings, with a focus on helping educators visualise connections between learning theories and teaching practice (Carvalho & Yeoman, 2018). Originally developed for use in Anglophone settings, this method has recently been translated for use in Spanish-speaking contexts. This paper presents findings from the thematic analysis of five workshops, exploring Spanish-speaking educators' perceptions of the functionality and value of the Activity-Centred Analysis and Design (ACAD) toolkit—in supporting design for learning in their contexts. In what follows, we offer a brief review

of existing models and frameworks in instructional design, learning design and design for learning, before describing the ACAD framework and toolkit.

2 INSTRUCTIONAL DESIGN, LEARNING DESIGN AND DESIGN FOR LEARNING

The origins of instructional design date back to the Second World War, with the work of psychologists and educators contributing to the development of materials for military training and industrial production in the US (Gibbons, Boling, & Smith, 2014; Reiser, 2001). These training materials mostly reflected behaviourist views of learning, using systematic approaches to the development of tasks and resources to support complex problem-solving and the efficient completion of specific tasks (Gibbons et al., 2014; Reiser, 2001). A significant contribution by Gagné (1965) included a list of teacher-led instructional events to guide design practice, with items such as: gaining attention, informing students about learning objectives, stimulating recall, providing learner guidance, eliciting performance, providing feedback, assessing the performance, and enhancing retention and transfer. Instructional design often involved a team of experts working together on task analysis, problem-solving, and testing, as they considered multiple perspectives from various stakeholders, e.g., students, teachers, subject matter specialists, education managers and others (Gagné, 1992; Hakkinen, 2002).

Amongst the most popular models are the Analysis, Design, Development, Implementation and Evaluation (ADDIE) model, Instructional System Design (ISD) and Four-Component Instructional Design 4C/ID (Grafinger, 1988; Molenda, 2003; Van Merriënboer, Clark, & Croock, 2002). ADDIE and ISD offer systematic ways of breaking the design process into phases, such as analysis, design, development, implementation or delivery, and evaluation (Hakkinen, 2002). And 4C/ID foregrounds key aspects of a design (learning tasks, supportive information, procedural information, and part-task practice) and the relations between them. Over the years, however, critiques of such models emerged, as researchers remarked that ADDIE takes a narrow approach, which does not neatly address the complexity of contemporary learning environments (Gibbons et al., 2014; Gray et al., 2015). In contrast, 4C/ID has been described as a more comprehensive model of problem-centred instructional design (Merrill, 2002), capable of framing the concrete, authentic “whole-task experiences” that are central to complex learning (van Merriënboer et al., 2002, p. 56). More recently, Costa, Miranda, and Melo (2022) described 4C/ID as suitable for teaching complex tasks due to its task-centred nature, which extends beyond traditional cognitive models.

However, the increased presence of technologies started to significantly alter the ways knowledge and ideas can be represented, created, and shared. These changes, alongside a need to go beyond cognitive elements in education called for new frameworks to support design, new ways of responding to shifting paradigms and different theories, centred on the learner rather than the teacher (Reigeluth, Beatty, & Myers, 2017). Goodyear (2015) argues that the rising complexity increases the need for teachers to develop design-oriented

skills. Models and frameworks provide a structured approach to design, therefore supporting the creation of engaging learning opportunities (Conole, 2019). The term learning design emerged to foreground constructivist perspectives, with their focus on learners and the learning environment rather than the teacher, and emergence of new models that often include resources and technologies to support learning activity within an ecological framing (Mor et al., 2015). Design for learning came to the fore, with an emphasis on learner-centred perspectives, but the term is used to stress that learning activity cannot be entirely designed or predicted in advance (Conole, 2019; Goodyear & Dimitriadis, 2013).

In recent decades, numerous design frameworks and models surfaced. Bower and Vlachopoulos (2018) offer a comprehensive review, with a focus on those commonly used in technology-enhanced learning. Two popular frameworks include the 7Cs of Learning Design (Conole, 2016) and the Conversational Framework (Laurillard, 2012). The former focuses on scaffolding the process of design (conceptualize, create, communicate, collaborate, consider, combine and consolidate). The latter focuses on the underlying process of learning (acquisition, collaboration, discussion, investigation, practice and production) and evolved into ABC Learning Design (Young & Perović, 2016) that uses a structured visual method to outline sequences of learning activities and associated outcomes. Looking beyond contributions from technology-enhanced learning, the Curriculum Design Coherence Model (Rata, 2019) makes the case for a knowledge-centred model that focuses on supporting students to develop their capacity to make informed judgements and skilfully carry them out in keeping with shared values.

In sum, many frameworks and models offer distinct ways to represent theoretical conceptualisations. However, educators often have difficulty putting them to work due to their abstract nature or a failure to consider the underlying pedagogical aspects of design (Bower & Vlachopoulos, 2018). While educational designers may welcome theoretical contributions to situate their work, they too struggle to apply them in context to specific design problems (Yanchar, South, Williams, Allen, & Wilson, 2010). In what follows, we trace the evolution and use of a set of resources designed to address this challenge; they are the material instantiation of the ACAD framework (Carvalho & Goodyear, 2014; Goodyear, Carvalho, & Yeoman, 2021), the ACAD toolkit (Yeoman & Carvalho, 2019).

3 THE ACAD FRAMEWORK AND TOOLKIT

The Activity-Centred Analysis and Design (ACAD) framework was developed to support educators and researchers understand and improve designs in increasingly complex learning situations (Carvalho & Goodyear, 2014; Goodyear, Carvalho, & Yeoman, 2021; Goodyear, Carvalho, Yeoman, Castañeda, & Adell, 2021). ACAD focuses attention on two key moments. The first, 'design time', in which educators engage in advanced planning including the selection and specification of tasks, tools, and social arrangements. The second, 'learn time', in which students interpret and act on what has been suggested. Understanding the distinction between these two moments is key, the first accounts for designable elements and the second does not because ACAD describes learning activity as emergent or

influenced (rather than determined) by design. Once this key distinction is grasped, educators are better able to establish connections between what has been designed (planned) and what learners actually do (learn), and these reflections provide meaningful and actionable feed forward into future (re)designs. Within the realm of the designable, ACAD focuses on three dimensions—the set, epistemic, and social (Figure 1), and the ACAD cards offer conversational prompts of elements within each dimension, to stimulate generative design conversations.

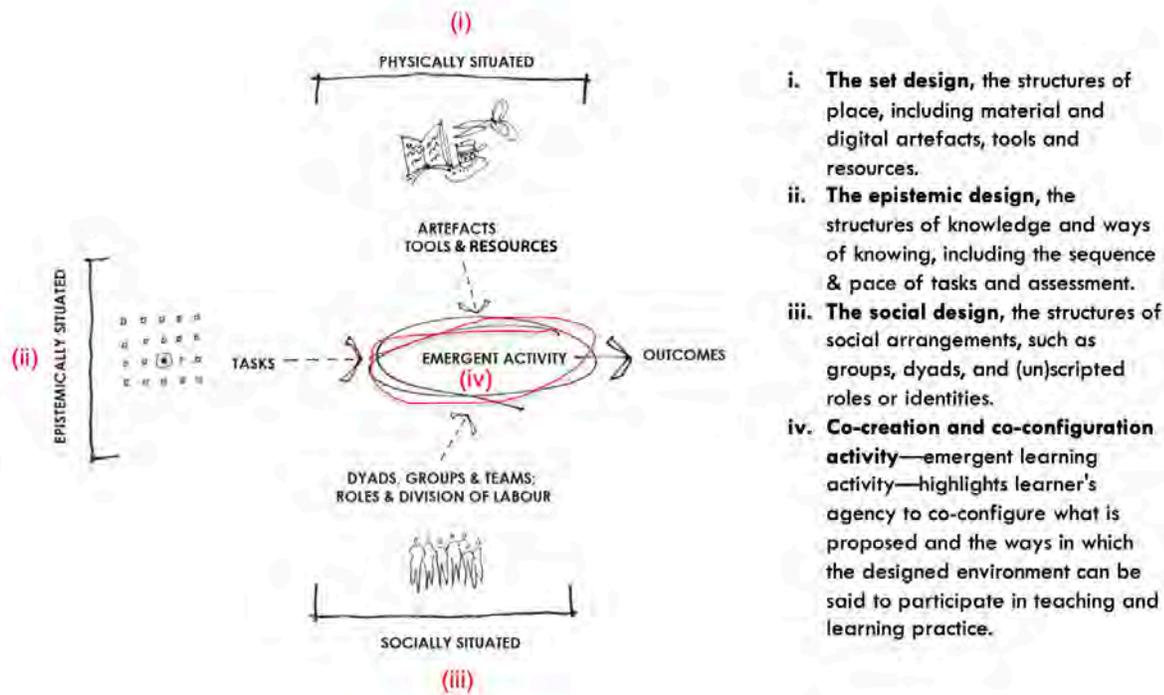


Figure 1 The Activity-Centred Analysis and Design framework (Carvalho & Yeoman, 2018)

The first set of ACAD cards was created as a practical way of engaging educational designers with the theory behind the ACAD framework. The second, to help educators, administrators, and architects working on learning space redevelopments (Yeoman & Carvalho, 2019). These cards were inspired by tools used in design anthropology (Gunn, Otto, & Smith, 2013) and educational research (Chatteur, 2011; Yeoman, 2015) with the intention of supporting *knowledge sharing* and *knowledge integration* (McDonnell, 2009). Both of which are critical in supporting design teams reach a shared understanding of critical concepts. The cards act as prompts for negotiating consensus on key elements, with specific reference to what is valued—in this instance types of learning activity and teaching practices.

An ACAD deck consists of about 100 cards in four colour coded sets. Three colours represent a dimension of design (set, epistemic, and social) and the fourth a range of high-level philosophies (Goodyear, 1999) or valued pedagogies. The cards have been used in

conjunction with a visual representation of the ACAD framework (Figure 2) or the ACAD wireframe (Yeoman, 2015). The ACAD wireframe (Figure 3) helps in identifying designable elements across dimensions of design (epistemic, set, social) and across levels (micro, meso, macro). Taken together, the framework, wireframe, cards, and case studies form the ACAD toolkit to help educational designers identify relationships between different design elements, as described in Yeoman and Carvalho (2019). This paper advances this previous work in two important respects. It is the first evaluation of the Spanish ACAD cards in use (whose translation and adaptation were described in Yeoman, Carvalho, Castañeda, and Adell (2020) and Goodyear, Carvalho, Yeoman, Castañeda, and Adell (2021), and it explores core functionalities of the ACAD cards as described by groups of educators working across a range of settings.



Figure 2 A deck of ACAD cards laid out on a representation of the ACAD framework

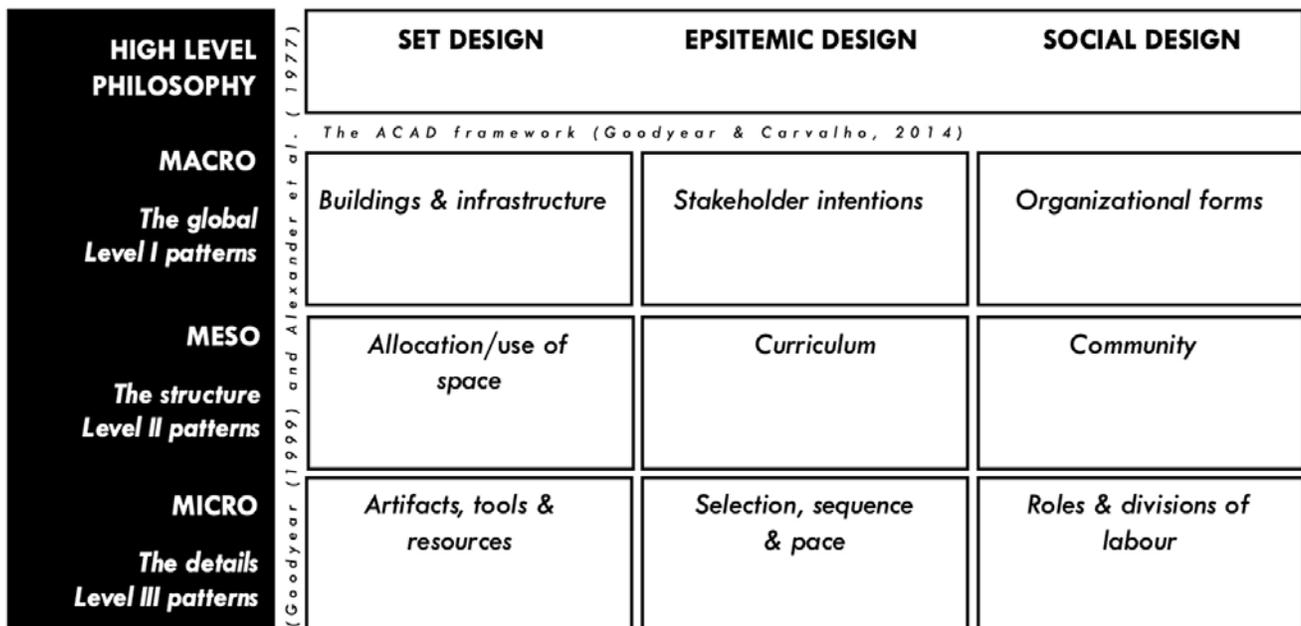


Figure 3 The ACAD wireframe (Yeoman, 2015)

4 METHODS

Five workshops were conducted at education professional collectives in Argentina and Spain, both countries where the translation and validation study of the toolkit was also conducted (Goodyear, Carvalho, Yeoman, Castañeda, & Adell, 2021; Yeoman et al., 2020). This allowed us to collect data at two different geopolitical regions and cultural contexts that shared language (Spanish-speaking) but had slightly different notions and conditions of practice for education professionals. A total of 40 Spanish-speaking participants (24 female and 16 male) from diverse educational backgrounds (see Table 1) participated in workshops that ran between 1.5 to 2 hours. In each of the workshops, participants were introduced to the ACAD framework and invited to explore it ‘as a tool for thinking’ with the help of the ACAD cards. Seated in groups, around tables on which a set of ACAD cards and a copy of the ACAD framework had been placed (see Figure 1), participants discussed terms and their application in practice and created representations of familiar and aspirational instructional designs. As participants worked, they were asked to consider how they might use the cards in other settings, including research, teaching, and teacher or academic professional development.

Ethical consent was obtained through the human ethics committee of the university hosting the project. Workshops were videotaped for analysis, and anonymity was achieved through pseudonyms. Verbatim transcripts of the videos were produced and reviewed in Spanish by the workshop facilitator (an author of this paper) before the production of

English translations. Careful attention to time stamps ensured all members of the research team had access to the full range of contextual information regarding workshop participants' including utterances and actions on the day (Nascimento, Da, & Steinbruch, 2019). Three researchers analysed the data.

Table 1 High-level participant summary of each of the five workshops

	Participants	Committed to	Working in
Workshop 1	9 educators, trained in academic professional development	educational innovation and the implementation of digital technologies in face-to-face teaching models	a central department at a large public university (approximately 45,000 students) in Mendoza, Argentina
Workshop 2	8 educators, specialists in the ethical use of innovative technologies	supporting academics in adopting new technologies and adapting pedagogies	an education centre in a medium sized public university (approximately 11,500 students) in Spain.
Workshop 3	7 academics, teaching preservice teachers	researching the use of digital technologies in education	the Department of Pedagogy at an (approximately 11,500 students) public university, in Spain.
Workshop 4	9 international master's students (Spain, Uruguay, Argentina and Brazil)	educational approaches that contribute to change in teaching and learning practice in primary, secondary and tertiary education	different educational institutions in Spain and abroad, doing a Master programme on teaching innovation.
Workshop 5	7 members of a community group, including primary and secondary teachers and subject matter experts	the innovative use of technologies from kindergarten to university, considering using the ACAD cards in an upcoming conference	Different educational organizations (primary and secondary schools) in the Community of Valencia, Spain

The first round of analysis involved each of the three researchers watching the videos and noting key themes related to the research question—*how does the ACAD toolkit support educational designers in tracing connections between learning theories, educational design, and teaching and learning practice?* After discussing initial independent findings, an agreement was reached on the first list of descriptive codes, and three sets of group terms (Saldaña, 2015). This process prompted the researchers to reflect on moments of particular intensity in the workshops and led to the adoption of the critical incident technique in a second round of analysis. Critical incidents have been widely used in qualitative studies to support reflection on behaviour (Shapira-Lishchinsky, 2011), and have also been used to reflect on learning experiences in teacher education research (Pierson, Goulding, & Campbell-Meier, 2020). As a method of qualitative inquiry, it supports the analysis of human behaviour through repeated observation, during which a researcher gathers details about an episode of interest to facilitate reflection on what it is that makes this particular episode remarkable (Adams & Rodriguez, 2020; Flanagan, 1954; Tripp, 2011).

In the second round of analysis, three criteria developed by Halquist and Musanti (2010) were used to identify key inflexion points: a degree of conflict, an element of surprise prompting critical reflection in the researcher, and a sense in which this critical moment represented a pattern of interaction. Traditionally, this is a process of self-reflection. In this instance, the researchers independently identified key moments before reflecting on them as a group. To facilitate the process, a template was used noting time, name or identifying phrase, code, a description of the incident (i.e., the 'what'), and a short explanation of the

rationale for its selection including an interpretation of the role it plays in the group's interactions (i.e., the 'why'). All critical moments were discussed before a final set was selected for further analysis. In what follows, we present excerpts from the transcripts of these critical incidents to illustrate the four major themes refined through our second round of analysis. Many of these excerpts illustrate more than one theme; but in discussing them, we focus on key aspects of each to develop a full description of the Spanish ANONYMISED cards in use.

Table 2 A summary of high-level themes after each round of coding

Round 1 global thematic exploration	Round 2 exploring critical incidents
Theme 1— naming benefits of using the ACAD cards in the session or in possible future settings	Theme 1— encouraging dynamic engagement with key elements and valued concepts
Theme 2 — telling stories about personal practice prompted by terms on the ACAD cards	Theme 2 — visualising (dis)connection and (in)coherence in designs
Theme 3 — remarks about the nature or utility of current terms on the Spanish ACAD cards	Theme 3 — prompting critical reflection on past practices and contexts
	Theme 4 — stimulating discussions about future teaching and learning practices and contexts

5 RESULTS

Critical moments identified at each workshop illustrate the high-level themes developed in the second round of analysis in response to our research question. To contextualise the excerpts, it helps to remember participants were seated around tables on which a set of ACAD cards had been placed on top of a drawing of the ACAD framework (see Figure 1), and each of the ACAD card refers to either an element of a dimension of design (set, epistemic or social) or a learning theory. For example, laptop (green, set design), group presentation (yellow, epistemic design), mentor (orange, social design), and social constructivism (blue, learning facilitated by modelling and observation). The toolkit also included pens and blank cards that could be customised by the participants, allowing them to add new elements to the deck of cards.

5.1 Theme 1 – Encouraging Dynamic Engagement with Key Elements and Valued Concepts

In Workshop 2, Francisco describes his first experience of working with the ACAD cards, which leads to an animated discussion about creativity based on 'shuffling' before the facilitator models the creation of a basic design, as she gathers 'a few cards' of different colours.

[00:35:02] Francisco: I see myself shuffling and then doing whatever comes out and if I don't like it, I shuffle again.

[00:35:08] Elena: That's creativity, I mean, I'm going to see what activity I can teach.

[00:35:09] Facilitator: But that would be, I, the teacher, would take this and get a few cards and, to see what comes out...

[00:35:16] Francisco: To see if it gives me ideas because...

[00:35:19] Facilitator: Yes, to see if it gives me ideas...

[00:35:20] Francisco: Oh, that's how it works.

In Workshop 5, David describes his first interaction with the ACAD cards in a similar fashion although he refers to his process as 'hunting' rather than shuffling.

[1:16:55] David: What I find interesting in this is not the fact that you come with your idea and pick up the cards, but that you hunt a card and say: with this, and this and this, what can we do?

In contrast to those highlighting the creative value of starting with a range of options, Emma voices the challenge of being faced with so much choice:

[00:27:09] Emma: Having too much, too much diversity of choice makes the choice complicated.

In response to our question about how the ACAD toolkit supports the work of educational designers, theme 1—encouraging dynamic engagement with key elements and valued concepts—highlights the ways in which the material familiarity of a deck of cards invites playful but purposeful engagement (shuffling and hunting) followed by discussions as they sort through the concepts inscribed on them. That is, simple but carefully selected prompts, embodying a theoretical framework, initiated discussion about a range of elements open to alteration through design and potential pedagogical strategies through which proposed designs could be enacted.

5.2 Theme 2 – Supporting the Visualisation of (Dis)Connection and (In)Coherence in Design

In Workshop 1, participants are working with a general question about the possible utility of using the ACAD toolkit in their work as educational designers. To this point they have been systematically discussing individual cards, ranking them according to relevance and placing them in three columns (least to most relevant) on the appropriate dimension of the image of the ACAD framework (yellow, epistemic etc). Lola has been listening intently but has said very little to this point. In the excerpt that follows, she describes how the elements named on the cards 'are all interrelated' and 'linked to the pedagogical part'. Lola references the ACAD wireframe (Figure 3), which she can no longer see but draws with her hands in the air above the table on which the cards have been laid in columns. Olga describes the ACAD cards' role when looking for coherence through self-reflection, which she describes as 'the birth of doubt'.

[00:38:05] Lola: I believe they are all interrelated. I can see there's something macro and then there are sub-levels, and those sub-levels are totally linked to the, the pedagogical part. That's why I see that they are also all linked.

[00:38:23] Olga: I think this is really useful to work with the teachers, and also to do a self-reflection; I mean, it's like it begins to, let's see, what of this do I apply in my work? What of this, I'm not applying? Or the birth of a doubt like: Do I apply this or not? How can I do this? Am I doing this or not? I think it's really good, eh, as an exercise to improve, and I believe that it may be really interesting for the teachers.

[00:38:56] Hanna: I think this would be great.

[00:38:57] Olga: Because you lead them to a situation of, let's see, should I do it or not? I don't know if, in really big groups, I would start on...

Similarly, in Workshop 4, the group reflects on the coherence between underlying theoretical assumptions and task design. In the excerpt below, participants are discussing the notion of high-level pedagogy (the first horizontal line of the ACAD wireframe), and Yaiza suggests it is possible to create a coherent and innovative design based on any learning theory (even behaviourism, one they feel does not reflect their values), based on the discipline of using the ACAD wireframe to review the design. They conclude that high-level pedagogy is a 'special category' because it forms 'the base' of any design, which is similar to the sentiment expressed by Lola, in the excerpt above.

[00:49:05] Yaiza: I have a sincere opinion about it really, that I think that, if we choose the pedagogies, I can, for example, pick any pedagogy and build an activity that relates to this theory.

[00:49:22] Sandra: Basing on that...

[00:49:23] Yaiza: Right, then I think it is the more stable, as a way of putting it, it is the more, it is like...

[00:49:28] Sandra: The base.

[00:49:28] Yaiza: Exactly, as the base is the pedagogy because for example, I can create a very innovative activity, as long as it is behavioural, as we had seen in the planning, or I can do it as a group activity but still be behavioural. So, it kind of seems to me that this has a special category.

In response to our question about how the ACAD toolkit supports the work of educational designers, theme 2—supporting the visualisation of (dis)connection and (in)coherence in designs—highlights the ways in which the representation of theory in a single graphic organiser, the ACAD wireframe, supports participants to see that the 'bigger picture' and the foundational, are not isolated from high-level pedagogy. Instead, they are the guiding 'purpose' towards which a design must be oriented.

5.3 Theme 3 – Prompting Critical Reflections on Current Practices and Contexts

In Workshop 3, participants discuss how the ACAD toolkit could be used to support the professional development of novice teachers, but the conversation evolves into a critical reflection on hierarchical structures within their university, how (old) teaching practices can be reproduced in (new) learning designs, how practices are influenced by organisational roles, and if novice teachers' should have autonomy to innovate or experiment with new ways of teaching leading to changes in their practices.

[00:30:48] Mike: Or it can also encourage training on something...maybe we didn't have...

Distinctive discussions in Workshop 5 led to a new critical perspective regarding the nature and role of learning spaces. Initially, spaces are considered to have limited or no influence on either design or learning activity. But as the conversation progresses, they conclude that different spaces (named on green set-design cards) do indeed produce different experiences and may even provide a point of departure for design.

[01:24:07] David: So, I think the challenge is to say let's do something alternative.

[00:30:55] Otto: One place would be the training of novices.

[00:30:55] Laura: Exactly. I was just thinking that...where people from all specialties come together and...

[00:31:06] Otto: Maybe we should make a toolkit adapted to novices, taking things out and putting things in.

[00:31:13] Norman: Okay, fine, I'll buy it, but the adaptation should be done by the old people. I'll explain. The novices, no, the novices have to come up with some tools they can use, but those tools have to be validated by those who are already doing that way.

[00:31:25] Facilitator: What happens is that, perhaps, those who are already doing so, do so because they have always done so, period?

[00:31:30] Norman: Okay, I buy it. I have the analysis, I have analysed that this is what they do, we will see what I find useful to incorporate or not; or what we find that the new ones may improve or not. But at the moment what are you doing? Is it always like this?

[00:31:44] Facilitator: No, just because it's always been done this way doesn't mean it should be done the same.

[00:31:48] Norman: Right, no, but you got the analysis done. I have the analysis done, so I think this might be wrong, okay? So, I'll change it, but I see what's being done.

[00:31:58] Facilitator: Okay, but then the, that is, that we analyse what is already done but not necessarily that the toolkit is validated by the old [ways of teaching]

[00:32:06] Norman: Okay, the question, the adjective is not validated, but they must put a starting point of something, what is being done, because when you get, again, to the subject ...

[00:32:16] Facilitator: But why do you have to do what is already being done? Why do I have to start from what others are doing?

[00:32:33] Norman: Me, in my case, because of my position.

[00:32:35] Facilitator: Sure, because of your position, but in principle it wouldn't have to be that way. I mean, we could teach novice teachers to think for themselves.

[00:32:44] Mike: It's still a combination of some of these.

[00:32:46] Laura: But you can be aware of what others are doing, which, maybe, keep doing some part of it, you may need it if you are not able to name what's being done, you can also realize that there are, in that same room there are other people, with other realities that shape it in a different way and you can also think "when they let me..."

In response to our question about how the ACAD toolkit supports the work of educational designers, theme 3—prompting critical reflection on current practices and contexts—highlights the ways in which the generous but constrained set of terms on the ACAD cards prompts wide ranging and important discussions about culture and the enactment of valued practice, and the role of space in enabling or constraining the activity it accommodates. In most instances, participants first attempt at sense-making with the ACAD cards was to discuss them within the context of their own teaching and learning practice and this often produced valuable insights or a critical rethinking of pedagogical strategies.

5.4 Theme 4 – Stimulating Thinking About Future Practices and Contexts

To illustrate theme 4—stimulating thinking about future practices and contexts—we selected an interaction between Andres and Elena, in Workshop 2. The group had been discussing the nature and number of the terms in a deck. As they wonder if the terms are too technical or too numerous Andres offers:

[00:08:47] Andres: At least this makes you aware of the existence of other things...

[00:08:59] Elena: Sure. They are very concrete examples, so it makes you wonder: if you follow something of this and if you would be interested in following it; and with what objective, of course, if...

[00:09:07] Andres: Or, or it, or it offers you an option that you have not considered until now and, see, because in my class I could use this better than what I am currently doing... Ah, the ones that have the, the, an illustration is because those are...

Remarks about 'thinking outside the box' can be found in all five workshops, but we will end with a short exchange between Carlos and Gary, in Workshop 5:

[01:38:03] Carlos: I mean, look, what I mean is, you put the cards on the table and here, maybe at the beginning there was chaos, there was chaos, one imagined that you had to put them together at random and see what happened. Another one has modelled an activity as she thought it, others have read cards and have been surprised by certain names that we didn't know and have looked behind to see if it was [Unintelligible]. This is a toolkit for thinking.

[01:38:31] Gary: A toolkit for thinking.

[01:38:32] Carlos: And I suppose that a debate discussing these things can be as valuable as an activity that ends with a thing designed all together. That's more practical, isn't it? It's more aimed to doing things.

In response to our question about how the ACAD toolkit supports the work of educational designers, theme 4—stimulating thinking about future practices and contexts—highlights the ways in which the ACAD cards provide a theoretically informed set of conversational prompts that invite participants to reimagine past practices and consider wholly new practices, with very little risk through discussion and representation. In the final excerpt above, Carlos, having worked with the ACAD toolkit for a little over half an hour, describes how the ACAD cards invited chaos, imagination, modelling, surprise, and uncertainty, in less than a minute. All of which led to discussions that 'can be as valuable as an activity that ends with a thing designed all together'.

The development of the ACAD toolkit and observations of its use in English-speaking settings has previously been reported (Yeoman & Carvalho, 2019). This study is the first to systematically explore the ACAD toolkit in action in Spanish-speaking educational design settings, partly thanks to translation and adaptation work that had been done previously (Goodyear et al., 2020) Goodyear, Carvalho, and Yeoman (2021); Yeoman et al. (2020). As such, it builds on prior work, broadening the context and focusing on how the ACAD toolkit supports the work of educational designers. Next, we discuss the perceived functionalities identified in the thematic analysis of the participants conversations around the ACAD toolkit.

6 DISCUSSION

Participants often commented on the significance of the ACAD cards for thinking about (or being reminded of) different aspects of design for learning, as well as for being prompted

to consider new theoretical perspectives (Vilppu, Södervik, Postareff, & Murtonen, 2019). Many of these discussions acknowledged the complex work involved in putting theory to work in practice and the many elements at play in any single and seemingly simple learning design (Mor & Mogilevsky, 2013). Participants also used the workshops as a space for imagining different ways of using the cards. The educators seemed to seize certain moments as an opportunity for being creative, for considering ways of innovating their teaching practices. The cards prompted reflections about new ideas for future teaching, for thinking “outside the box”, thus sparking opportunities for opening educators’ minds to new pedagogical possibilities. This finding is in line with Vilppu et al. (2019), who noted that whilst workshops using toolkits are often short, these short-lived moments can have lasting effects on individuals’ interpretations of their teaching practices (Vilppu et al., 2019). Planting a seed is crucial, as it helps educators to imagine other potential scenarios, and encourages more reflective teaching practices. Professional development sessions that promote short critical experiences can be mutually enriching when scaffolded and supported by theoretically informed materials that promote deep reflection. Similar findings were also reported by Lewin, Cranmer, and Mcnicol (2018), who introduced a new resource to scaffold learning design processes and help educators reimagine old practices and reflect on possible new practices. Importantly, Lewin et al. (2018) highlight the role of shared experiences of co-design (such as those promoted with the use of ACAD toolkit) in helping educators to integrate theory and practice because critical design conversations foster opportunities to build on each other’s ideas, refine initial proposals, and co-create new knowledge through participating in a community of practice (Chen, Shui, & Håklev, 2022). Our findings also suggest participants used workshops as a space for critical reflections on current practices and contexts. Discussions, initially sparked by the cards, quickly led to deeper reflections about their own educational contexts and institutional practices. Moreover, participants often considered issues not previously considered to directly affect a specific learning design or educational situation, acknowledging these issues did affect their work. Thus, through conversations participants seemed to think about other contextual factors—theoretical and practical—and how they shape their reality by indirectly impacting practice in subtle or often unseen ways. Through these moments of self-reflection, participants seemed to gain insights, that went beyond the limits of everyday teaching practice in which they contextualise themselves and their students as a part of a more complex education system, beyond the boundaries of the classroom. This included conversations about how multiple factors can directly or indirectly influence their practice and their students experience of learning in various ways that can at times produce a pedagogical fragility (Kinchin & Winstone, 2017). Li and colleagues (2022) note that most systems designed to support teachers’ in designing for learning tend to focus on the initial stages of the design cycle, with little support for evaluation to inform intervention and redesign. This foregrounds the need to create opportunities for educators to engage in conversations about learning design in ways that go beyond the tool itself, promoting relevant discussions about learning in which educators themselves are learning. Framed as such, this challenge could support the development of new approaches to teacher training and academic professional development. Within this

context, we argue that the ACAD framework and cards are capable of supporting educators consider and even adopt new educational paradigms in response to a range of current and emerging complex issues affecting education (Li et al., 2022).

7 CONCLUSION

Since the mid-twentieth century, instructional design models and learning design frameworks have supported educators in designing for learning. However, many educators still find it difficult to understand how theoretical conceptualisations can be used to inform contextualised learning design (Bower & Vlachopoulos, 2018; Yanchar et al., 2010). What is more, as the tools available for learning evolve in tandem with the circumstances in which we learn, the need for increasingly dynamic methods to support design and analysis for learning only increases (Carvalho & Yeoman, 2018). In our work, we foreground the complexity of learning situations, taking an architectural approach that traces connections between discrete elements of learning networks, and the totality of learning networks themselves (Carvalho & Goodyear, 2014; Goodyear, Carvalho, Yeoman, Castañeda, & Adell, 2021; Yeoman, 2017). This approach allows us to break down the complexity of any given learning situation, alternately foregrounding part-whole relationships, and examining the connections and coherence across the entire network. In this paper, we illustrate how this framing was helpful in supporting educational designers to initiate design conversations that demonstrated knowledgeable action, or theoretically driven practice (Markauskaite & Goodyear, 2017).

Educators are always preparing the next generation to take their place in society. Whilst values and purposes may change, we believe the role of the educator is always to lead out into what lies ahead (Castañeda et al., 2022). Maybe every generation feels they are on the cusp of something new? Even so, there is little doubt future generations will be called on to work collaboratively in addressing a growing number of complex problems. The United Nations Sustainable Development Goal SDG#4 focuses on ensuring “inclusive and equitable quality education” and promoting “lifelong learning opportunities for all” (UNESCO, 2022). To do this well educators will need methods and tools capable of supporting them to design for learning in contexts that involve complex concepts (epistemic design), in ever evolving postdigital environments (Jandrić et al., 2018) in which the digital and physical are intertwined (set design), and where students will require support to collaborate in heterogeneous groups with wide-ranging and often competing values (social design). Furthermore, educators will need support in developing a range of pedagogical practices that support agency, ubiquity, collaboration, participation, and co-creation in learning (Castañeda et al., 2023). In conclusion, educators need opportunities to work with tools and methods that acknowledge complexity, as they themselves work to prepare students to address the challenges of our not-so-distant future. From pressing needs and lofty aims to the simple and singular contribution of this paper, in the words of Carlos, “...at the beginning, there was chaos...And I suppose that a debate discussing these things can be as valuable as an activity that ends with a thing.... That’s more practical, isn’t it? It’s more aimed to doing

things.”

8 AUTHOR CONTRIBUTIONS

Lucila Carvalho and Pippa Yeoman worked on conceptualization of the original ideas used at the workshops. Linda Castañeda led the research investigation in the Spanish and Argentinian contexts. All three authors contributed to formal analysis, the methodology in this study, and writing and revising this manuscript.

ACKNOWLEDGEMENTS

The authors wish to acknowledge and thank all workshop participants for their contribution to this work.

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